REMARKS

This Response responds to the Office Action dated March 8, 2007 in which the Examiner rejected claims 1, 3-4 and 10-12 under 35 U.S.C. §103.

Claim 1 claims a semiconductor light emitting device comprising a mesa section, an insulating film and an inorganic insulating film. The mesa section has at least a sandwich structure of an n-type clad layer, an active layer and a p-type clad layer which are constituted by compound semiconductor layers formed on a substrate. The insulating film of polyimide covers the mesa section excluding a contact region. The inorganic insulating film has a porous area defined by cylindrical vacancies so as to cover the insulating film excluding the contact region. The inorganic insulating film has a vacancy rate of 50% or more while being oriented substantially in parallel with a surface of the substrate, and the vacancies are arranged at periodic intervals.

Through the structure of the claimed invention a) having an insulating film of polyimide covering the mesa section excluding the contact region and b) having an inorganic insulating film 1) having a porous area defined by cylindrical vacancies, 2) having a vacancy rate of 50% or more while being oriented substantially in parallel with a surface of the substrate and 3) having the vacancies arranged at periodic intervals, as claimed in claim 1, the claimed invention provides a semiconductor light emitting device having a reduced pad capacity and increased modulating speed. The prior art does not show, teach or suggest the invention as claimed in claim 1.

Claims 1, 3-4 and 10-12 were rejected under 35 U.S.C. §103 as being unpatentable over *Naone et al.* (U.S. Patent No. 6,898,215) in view of *Yang et al.* (U.S. Patent No. 6,716,378).

Applicants respectfully traverse the Examiner's rejection of the claims under 35 U.S.C. §103. The claims have been reviewed in light of the Office Action, and for reasons which will be set forth below, Applicants respectfully request the Examiner withdraws the rejection to the claims and allows the claims to issue.

Naone et al. appears to disclose a vertical cavity surface emitting lasers ("VCSELs"), and more particularly, to VCSELs that emit light at a nominal wavelength of 1.3 μm or higher. (Column 1, lines 23-26). Referring now to FIGS. 7A-7J there is shown a series of cross-sections (including both sections AA taken through the n-type intra-cavity contact and BB taken through the polyimide/interconnect metalization of FIG. 6) that illustrate an exemplary processing method to produce VCSELs. (Column 12, lines 46-50). The semiconductor light-emitting device 400 comprises a plurality of compound semiconductor layers epitaxially-grown on a semi-insulating substrate 402. In the described exemplary embodiment, the semiconductor layers form a lower mirror stack 404 above the substrate and an n-type contact stack 406 above the lower mirror stack 404 and below an optical cavity 408. (Column 12, lines 61-67). Referring to FIG. 7F, a passivation layer 454 may be deposited onto the semiconductor wafer to protect and passivate the etched mesas and exposed semiconductor layers. The passivation layer may be formed any one of variety of insulating material commonly used in the art including polyimides, spin-on-glasses, silicon dioxide, silicon nitride, and the like. Referring to FIG. 7G, vias may be etched, masked by photoresist 460, in the passivation layer 454 to provide access to the p-type 428 and n-type 434 ohmic contacts. FIG. 7H illustrates cross-section BB (see FIG. 6) taken through polyimide layers 462 and 464 that are deposited and etched in accordance with photoresist

466 to form ramps from the isolation region 452 (FIG. 7E) to the p-type and n-type contacts respectively. (Column 13, lines 41-55).

Thus, *Naone et al.* merely discloses polyimide layer 454 covered with polyimide layer 462, 464. Nothing in *Naone et al.* shows, teaches or suggests an inorganic insulating film covering the insulating film of polyimide as claimed in claim 1. Rather, *Naone et al.* teaches away from the claimed invention since the polyimide layer 462, 464 are organic polymer and not an inorganic insulating film.

Furthermore, since *Naone et al.* merely discloses polyimide layer 462, 464, nothing in *Naone et al.* shows, teaches or suggests an inorganic insulating film a) having a vacancy rate of 50% or more while be oriented substantially in parallel with a surface of the substrate and b) having the vacancies arranged at periodic intervals as claimed in claim 1. Rather, *Naone et al.* only discloses polyimide layer (organic polymer) 462, 464.

Yang et al. appears to disclose a method for synthesis of hierarchically ordered materials at multiple length scales using polyalkylene oxide triblock copolymers. (Column 1, lines 25-27). Many applications for macro- and mesoporous metal oxides require structural ordering at multiple length scales. Thus, there exists a need for hierarchically ordered materials and a method for forming the materials which overcome or minimize the above mentioned problems and which have enormous potential for a variety of immediate and future industrial applications. A need also exists for forming the hierarchically ordered materials using low-cost, non-toxic, and biodegradable polyalkylene oxide block copolymers. (Column 2, lines 31-40). Mesoporous materials and mesoscopic structures having orders at multiple length scales are synthesized. Synthesis is carried out by contacting a mold, which

ends have been cut, with a substrate. A mold is filled with a latex colloidal suspension, whereby an array is formed within the mold. An amphiphilic block copolymer is then combined with an inorganic metal compound, preferably by creating a sol, and the mold is filled with the sol whereby the block copolymer and inorganic metal compound are self-assembled and polymerized into a mesoscopically structured material exhibiting multiple structural ordering length scales on the order of approximately 10, 100, and 1000 nm. (Column 3, lines 9-20).

Thus, *Yang et al.* merely discloses a method for forming hierarchically ordered materials whereby a block copolymer and an inorganic metal compound are self-assembled and polymerized into a structured material. Nothing in *Yang et al.* shows, teaches or suggests why this material would be used in a semiconductor light emitting device comprising a mesa section, an insulating film of polyimide and an inorganic insulating film as claimed in claim 1. Rather, *Yang et al.* is merely directed to a method of preparing a hierarchically ordered structure.

The combination of *Naone et al.* and *Yang et al.* would not be possible. Nothing in *Naone et al.* shows, teaches or suggests an inorganic insulating film covering an insulating film of polyimide as claimed in claim 1. *Yang et al.* is directed to a method of forming a self-assembled structured material. Nothing in either reference shows, teaches or suggests why the material of *Yang et al.* would be used in place of the polyimide layer 462, 464 of *Naone et al.* Therefore, Applicants respectfully request the Examiner withdraws the rejection to claim 1 under 35 U.S.C. §103.

Claims 3-4 and 10-12 depend from claim 1 and recite additional features. Applicants respectfully submit that claims 3-4 and 10-12 would not have been

obvious within the meaning of 35 U.S.C. §103 over *Naone et al.* and *Yang et al.* at least for the reasons as set forth above. Therefore, Applicants respectfully request the Examiner withdraws the rejection to claims 3-4 and 10-12 under 35 U.S.C. §103.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is requested to contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicants respectfully petition for an appropriate extension of time. The fees for such extension of time may be charged to Deposit Account No. 02-4800.

In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: June 6, 2007

By: _____
Ellen Marcie Emas
Registration No. 32131

P.O. Box 1404
Alexandria, VA 22313-1404
703 836 6620